



P.I. Engineering, Inc.

Manufacturing and Prototype Development Capabilities

Let us help design and produce your ideas.

P.I. Engineering, Inc. has been designing, manufacturing and distributing human interface electronics since 1993. Our products range from simple USB keypads and mission critical control keyboards to completely integrated data collection systems and full-sized railroad locomotive simulators. The experience gained by 30 years of electronic design and production allows us to be the perfect partner to bring your ideas and designs to life in our Williamston, Michigan facility with the help of local and worldwide suppliers.

Our own X-keys product line keeps us constantly aware of customer needs and subtle technological changes in diverse consumer and industrial applications. This deep understanding of Human Input Devices (HID) and the Human Machine Interface (HMI) gets incorporated in all the work we do.

We have successfully brought products of all scales to market, some of our products get produced in small quantities while others are made in the thousands per year. We understand the tricks of starting a project, guiding it from concept to a fully manufacturable product and all the steps along the way.

With our extensive in-house capabilities, your design will be protected and confidential from concept to production. Simultaneously we can add our experience and expertise for the aspects you may not be familiar with. If you exceed our in-house production capacities, we will help move your project to a contract manufacturer capable of producing volumes in excess of 100,000 units.

Our capabilities include:

- *Circuit design*
- *PCB layout and procurement*
- *PCB assembly, surface mount and through hole*
- *Integration of our large selection of pre-made, HMI designs and components*
- *Enclosure design and production*
- *In-house CNC metal and plastic cutting lasers and routers*
- *Hydraulic bending presses, punches, drills, taps and fixture production*
- *Stock extrusions and plastic components*
- *Custom engineering of injection molded plastic parts*
- *Coating and decorating of finished parts*
- *Final assembly and QC testing*
- *Packaging, packing, and complete fulfillment*

We can handle your project every step of the way and all the way to production.

The Design, Engineering and Production Process:

We will be happy to discuss your **basic goals, ideas and concepts at no charge**. If the project is something where our capabilities and experience will provide your desired outcome we can proceed to a more formal arrangement.

Typically, we succeed in bringing **start up projects to life, re-designing old technology** to work with today's computer IT infrastructure, producing **smaller quantities of mission critical control devices** and **"on-shoring" design and production** for higher quality and availability.

The process starts with your idea or current product you wish to create or improve. **We discuss your goals and use of the product so we can determine the best design and manufacturing process to meet them**. From there we make a very rough estimate of the scope and cost.

If it all seems reasonable, we will spend some engineering time to create a more concrete estimate of the costs and timelines. *There is some cost for this phase, because, strangely, we cannot estimate a cost if we do not know the complete design, and we cannot know or understand the design without giving it our proper attention.*

Your project can have several phases depending on the complexity and how many pre-designed elements we implement.

General Statement of Work

We outline what will be done and the responsibility of each party for various aspects of the project.

Proof of Concept

This may be bread boarded circuits or pre-made components "hacked" together to help prove the design is possible and creates the desired outcome.

Final Design Documents and Specifications

Specific design documents are produced and all parties agree to the specifications and production techniques used.

Mock-up

If the product has significant physical and ascetic properties, this phase may be needed before an actual working prototype can be made. Techniques such as 3D printing and non-functional "PCBs" are used to make a tangible device for analysis and showing to other stakeholders in the project.

Prototypes

These are the first working units but often do not use all the final production techniques. They will be able to test and prove most of the design and may expose issues unforeseen in prior phases. We use these for interactive feedback from all project stake holders. If major improvements get implemented the prototype phase might need repeating.

Change Orders

When issues get discovered with the prototypes (and they will) we work with you to create the proper changes, document the issues and solutions to create the final product you and your customer expect.

Pilots

After a satisfactory prototype has been made, we will produce a small number of pilot units. These use final production techniques so we can prove that the chosen production methods work. These should be thoroughly tested by everyone, even distributed to certain trusted customers to get feedback.

Limited Production Runs

The first run should be limited as small issues can sometimes be discovered after a product gets deployed. We want to catch issues early to avoid having to retrofit a large production run.

Standard Production

These are repeat orders of the same product. Your minimum order quantity may be very low and released on your schedule. Larger volume production runs allow us to take advantage of discounts and other volume base savings we can pass on to you.

We look forward to working with you and hearing about any projects you need help with.

Please contact P.I. Engineering's Sales department:
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